भारतीय मानक

Indian Standard

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आईपीटीवी के लिए डिज़िटल सैट टॉप बॉक्स — विशिष्टि

Digital Set Top Box for Iptv — Specification

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July 2018 **Price Group 4**

Audio, Video and Multimedia Systems and Equipment Sectional Committee, LITD 07

FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards, after the draft finalized by the Audio, Video and Multimedia Systems and Equipment Sectional Committee had been approved by the Electronics and Information Technology Division Council.

There is no ISO/IEC Standard on this subject.

The Committee responsible for the formulation of this standard has reviewed the provisions of the international publications listed in Annex B and has decided that these may be used in conjunction with this standard till Indian Standards on these subjects are published.

The Internet Protocol Television (IPTV) Service has been defined in the Telecommunication (Broadcasting and Cable) Services (Fourth) (Addressable Systems) Tariff Order, 2010, as under:

‘Internet protocol television service’ means delivery of multi-channel TV programmes in addressable mode by using internet protocol over a closed network of one or more service Providers.

Further the guidelines issued by Ministry of Information & Broadcasting for provisioning of IPTV services read as under:

> ‘An IPTV service (or technology) is the new convergence service (or technology) of the telecommunication and broadcasting through QoS controlled Broadband Convergence IP Network including wire and wireless for the managed, controlled and secured delivery of a considerable number of multimedia contents such as Video, Audio, data and application processed by platform to a customer via Television, PDA, and Mobile TV terminal with STB module or similar device.’

The composition of the Committee responsible for the formulation of this standard is given in Annex C.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 ‘Rules for rounding off numerical values (*revised*)’. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

DIGITAL SET TOP BOX FOR IPTV — SPECIFICATION

1 SCOPE

This standard specifies the requirements of a digital Set Top Box (STB), for use by the subscribers to receive IPTV services delivered to the viewers' homes using a 'broadband network'.

The STB could also be used for receiving IPTV services delivered using high speed Digital Subscriber Line (DSL) based access technologies for example Asymmetric Digital Subscriber Line (ADSL2, ADSL2+), Very High Bit Digital Subscriber Line (VDSL), etc, or for receiving services delivered *via* a broadband modem connected to a 4G network. In this case STB is to be connected to the DSL Modem or the Broadband Modem using the Ethernet connector.

2 REFERENCES

The standards listed in the Annex A and Annex B contain provisions, which through reference in this text constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreement based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standard indicated in the Annex A and Annex B.

3 REQUIREMENTS

3.1 The IPTV STB shall be based on open (non proprietary) architecture and shall ensure technical compatibility and effective interoperability amongst different IPTV services in the country. The interoperability shall be achieved by complying with the following ETSI standards:

a) ETSI TS 102 034 : Digital Video Broadcasting (DVB); Transport of MPEG-2 TS Based DVB Services over IP Based Networks;

b) ETSI TS 102 542-1 : Digital Video Broadcasting (DVB); Guidelines for the implementation of DVB-IPTV Phase 1 specifications; Part 1: Core IPTV Functions.

c) ETSI TS 102 539 : Digital Video Broadcasting (DVB); Carriage of Broadband Content Guide (BCG) information over Internet Protocol (IP)

d) ETSI TS 102 824 : Digital Video Broadcasting (DVB); Remote Management and Firmware Update System For DVB IP Services.

e) ETSI TS 102 366 : Digital Audio Compression (AC-3, Enhanced AC-3) Standard

3.2 Specifications

The specifications for the various features and capabilities for the STB shall be as given in **4**.

3.3 Performance Requirements

The performance requirements for the IPTV STB are given in Table 1.

3.4 Safety Requirements

The safety requirements of the STB shall conform to IS 13252 (Part 1).

3.5 Electromagnetic Compatibility (EMC) Requirements

The EMC requirements of the STB shall conform to IS 6873 (Part 3).

3.6 Content Protection

To ensure that the signals of TV channels are viewed only by authorized users, the IPTV service provider has to provide some form of content authentication and security systems. Any content protection may complied with DVB-Content Protection and Copy Management Standards (*see* ETSI TS 102 825 Part 1, 3, 4, 5, 7).

4 SPECIFICATIONS

4.1 Software Specifications

a) The STB shall have the capability to receive the following three types of services delivered using Real Time Stream Protocol (RTSP) as per ETSI TS 102 034.

   1) Live Media Broadcast (LMB): Delivery in Unicast or Multicast

   2) Media Broadcast with Trick Modes (MBwTM): Delivery in Unicast only.

   3) Content on Demand (CoD) Delivery in Unicast. User initiates a presentation

b) The IPTV STB should conform to the complete protocol stack used for the delivery of the services mentioned in **4.1**(a) as per ETSI EN 300 468.

   For carriage of DVB-SI in transport streams following are applicable as per ETSI EN 300 468.

   1) Carriage of Programme Associate Table (PAT) and Programme Map Table (PMT) is mandatory on all transport streams.

   2) Option 1: Carriage of all DVB SI tables except NIT (TS-Full SI)

   3) Option 2: Carriage of tables other than PMT & PAT is optional (TS-Optional SI)

      NOTE — ETSI EN 300 468 gives complete specifications on DVB SI to be carried in MPEG TS for Broadcasting whereas TS 102 034 specifies the two options specifying the SI tables to be carried in IPTV.

c) On connection to the network, the IPTV STB should send a broadcast query requesting info from the Dynamic Host Configuration Protocol (DHCP) server. On receiving this request, the DHCP server will assign an IP address to the STB as per ETSI TS 102 034.

d) The IPTV STB should build a list of service providers and the different services available from each service provider using the Service Discovery / Selection (SD&S) information. The SD&S process should be as per ETSI TS 102 034.

   NOTE — SD &S protocol for multicast services is transported in IP packets in accordance with the DVB STP protocol whereas for Unicast services SD&S info is transported in HTTP.

e) In order to get the software update, the system software of an IPTV STB shall be updated on a power-cycle or reboot as per ETSI TS 102 034. The sending of the system software will be handled by the mechanisms specified in TS 102 824. ‘Digital Video Broadcasting (DVB) : Remote Management and Firmware update for DVB IP Services’.

f) The IPTV STB should have the capability to generate Broadband Content Guide through information of Metadata as per ETSI TS 102 539.

   NOTE — Anytime Meta data describing both Content on Demand as well as Live services delivered over an always on bi-directional IP Networks.

g) If an IPTV STB is equipped with appropriate local storage, it should be able to use the push download and pull download services as per ETSI TS 102 034. The STB shall support video format as per ETSI 102 005.

   NOTE — In push download services, the distribution decision is taken by the service provider whereas in pull download services, the download is requested by the user.

h) If the sender is using the protocol for Application Layer FEC (AL-FEC) protection of streaming media for DVB-IPTV services carried over RTP transport as per ETSI TS 102 034, then the associated IPTV STB should have the capability to decode this FEC.

j) The STB should have mechanism to provide immediate feedback (FB) towards the network using RTCP and how to retransmit the missing packets as per ETSI TS 102 034.

k) In case server at the transmitting end has many options, the STB shall have the function of Remote Management System (RMS) and the Firmware Update Service (FUS) as per ETSI TS 102 824. Remote management should have the option of firmware updates to the equipment.

4.2 Hardware Specifications

Sl No. (1)	*Parameter/ Specification* (2)	*Mandatory* (3)	*Optional* (4)
i)	Interfaces/ Connectors	a) Input :10/100 Base T Ethernet b) Analog Audio Output c) Stereo RCA d) Composite Video Out RCA (Yellow)	a) 1000 BaseT Ethernet connector RJ45 b) Compressed Multichannel Audio output: S/PDIF c) Uncompressed digital AV Streams Output: HDMI Port V 1.3a or above d) USB 2.0 or above e) wifi interface or any other home network interface.
ii)	Graphics resolution	Standard definition (SD): 720 × 576	High Definition (HD): 720p or 1080i or higher with capability to down-convert to SD (720x576).
iii)	Command device	IR Remote control	Keyboard / Mouse
iv)	Local storage.	—	Hard Disk and/or USB 2.0 or above

5 MARKING

5.1 Each STB shall be legibly and indelibly marked with at least the following information:

a) Manufacturer's name or trade-mark (if any);
b) Model designation and Serial No.;
c) Country of manufacture;
d) Input supply voltage and frequency;
e) Power consumption;
f) Ethernet input/output; and
g) All connectors.

5.2 BIS Certification Marking

The STB may also be marked with the Standard Mark.

5.2.1 The use of the Standard Mark is governed by the provisions of *The Bureau of Indian Standards* Act, 2016 and the Rules and Regulation made thereunder. The details of conditions under which a license for the use of Standard Mark may be granted to manufacturers and producers may be obtained from the Bureau of Indian Standards.

6 ENVIRONMENTAL TESTS

6.1 Bump Test

The STB shall be subjected to bump test carried out in accordance with IS 9000 (Part 7/Sec 2), the number of bumps being 500 + 10 and acceleration being 400 m/s^2. After this test the receiver shall conform to the performance requirements specified in **6.6**. This test shall be carried out under packed condition.

6.2 Drop Test

The STB shall withstand drop test as given in IS 13252. After this test the STB shall conform to the performance requirements specified in **6.6**.

6.3 Dry Heat Test

The STB shall be subjected to dry heat test of severity + 55°C for 16 h, carried out in accordance with IS 9000 (Part 3/Sec 5). After recovery, the STB shall conform to the performance requirements specified in **6.6**. The duration of the recovery shall be 2 h.

6.4 Damp Heat Test

The STB shall be subjected to damp heat cyclic test in accordance with IS 9000 (Part5/Sec 1). After recovery the STB shall conform to the performance requirements specified in **6.6**. The duration of the recovery shall be 24 h.

6.5 Cold Test

The STB shall withstand, a cold test of severity –10°C for 2 h carried out in accordance with IS 9000 (Part 2/Sec 4). After recovery, the receiver shall conform to the performance requirements specified in **6.6**. The duration of the recovery shall be 2 h.

6.6 Post Measurement after Each Environmental Test

It should meet performance requirement as per **3.3** and safety requirement as per **3.4**.

7 OPERATING LIFE TEST

The STB shall be subjected to operating life test consisting of 5 h operation and 1 h rest period for a total operating period of 1 000 h at rated voltage and at ambient temperature. At the end of the operating life duration, the requirements specified in **3.3** and **3.4** shall be met with.

Table 1 Performance Requirements

(*Clause* 3.3)

Sl No. (1)	Parameter/Specification (2)	Mandatory (3)	Optional (4)
i)	Electrical specification: a) Input voltage range b) Frequency	 90–270 V a c 50 Hz ± 2 percent	–
ii)	Operating ambient temperature	0°C to 50°C	–
iii)	Operating humidity range	5 percent to 95 percent (non condensing)	–
iv)	Front panel features: a) Controls b) LED Indicators	 a) Power/Stand by b) Power, Link,	a) Controls : Button Control or navigational Keys
v)	Back panel: a) Ethernet	10/100 Mbps Ethernet RJ45	1 000 Mbps Ethernet RJ45
	b) Audio video connectors	1) Composite Video RCA 2) Stereo L, R Audio RCA	a) S/PFIF output b) HDMI V1.3a or higher c) External IR Receiver d) USB 2.0 Port or above e) Mic Input 3.5 mm Slot Mini-jack f) Component, Y, Pb, Pr
vi)	Video codec	MPEG–2	a) MPEG–4 b) HEVC
vii)	Audio codec	MPEG1 Layer 2	The STB should have the capability to do either of: a) decompress, decode according to metadata and down-mix to Stereo for Multichannel audio, all or either of the following formats: 1) E-AC-3 2) AC-3 3) MPEG-4 HE AAC b) Pass through all or either of the following multichannel formats: 1) E-AC-3 2) AC-3 3) MPEG-4 HEAAC c) transcode all or either of the following input formats to AC-3: 1) E-AC-3 2) MPEG-4 HE AAC
viii)	Remote control (IR support) Keys/Buttons/Indicators	Compatible with STB and service	
ix)	Batteries for remote hand Set	AA or AAA	
x)	Supported video output	PAL	
xi)	Aspect ratio	4:3 and 16:9	

ANNEX A

(*Clause* 2)

LIST OF REFERRED INDIAN STANDARDS

IS No.	*Title*
6873 (Part 3) : 2015	Limits and methods of measurement of radio disturbance characteristics: Part 3 Sound and television broadcast receivers and associated equipment (*first revision*)
9000 (Part 2/ Sec1to 4) : 1977	Basic environmental testing procedures for electronic and electrical items: Part 2 Cold test, Section 4 Cold test for heat dissipating items with gradual change of temperature

IS No.	*Title*
9000 (Part 3/ Sec 1 to 5) : 1977	Basic environmental testing procedures for electronic and electrical items: Part 3 Dry heat test, Section 5 Dry heat test for heat dissipating items with gradual change of temperature
9000 (Part 5/ Sec 1 and 2) : 1981	Basic environmental testing procedures for electronic and electrical items: Part 5 Damp heat cyclic test, Section 1 16 + 8 h cycle
9000 (Part 7/ Sec 1 to 5) : 1979	Basic environmental testing procedures for electronic and electrical items: Part 7 Impact test, Section 2 Bump
13252 (Part 1) : 2010 IEC 60950-1 : 2005	Information Technology equipment — Safety : Part 1 General requirements

ANNEX B

(*Clause 2*)

LIST OF REFFERED INTERNATIONAL STANDARDS/PUBLICATIONS

International Standards/Publication	*Title*
ETSI TS 102 005	Digital Video Broadcasting (DVB); Specification for the use of Video and Audio Coding in DVB services delivered directly over IP protocols
ETSI TS 102 034	Digital Video Broadcasting (DVB); Transport of MPEG-2 TS Based DVB Services over IP Based Networks;
ETSI TS 102 366	Digital Audio Compression (AC-3, Enhanced AC-3) Standard
ETSI EN 300 468	Digital Video Broadcasting (DVB); Specification for Service Information (SI) in DVB systems
ETSI TS 102 542-1	Digital Video Broadcasting (DVB); Guidelines for the implementation of DVB-IPTV Phase 1 specifications; Part 1: Core IPTV Functions
ETSI TS 102 539	Digital Video Broadcasting (DVB); Carriage of Broadband Content Guide (BCG) information over Internet Protocol (IP)
ETSI TS 102 824	Digital Video Broadcasting (DVB); Remote Management and Firmware Update System For DVB IP Services.
ETSI TS 102 825-1	Digital Video Broadcasting (DVB); Content Protection and Copy Management (DVB-CPCM); Part 1: CPCM Abbreviations, Definitions and Terms
ETSI TS 102 825-3	Digital Video Broadcasting (DVB); Content Protection and Copy Management (DVB-CPCM); Part 3: CPCM Usage State Information
ETSI TS 102 825-4	Digital Video Broadcasting (DVB); Content Protection and Copy Management (DVB-CPCM); Part 4: CPCM System Specification
ETSI TS 102 825-5	Digital Video Broadcasting (DVB); Content Protection and Copy Management (DVB-CPCM); Part 5: CPCM Security Toolbox
ETSI TS 102 825-7	Digital Video Broadcasting (DVB); Content Protection and Copy Management (DVB-CPCM); Part 7: CPCM Authorized Domain Management

ANNEX C

(*Clause* 2)

COMMITTEE COMPOSITION

Audio,Video and Multimedia Systems and Equipment Sectional Committee, LITD 07

Organization	*Representative(s)*
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Amendments Issued Since Publication

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